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ABSTRACT

This booklet, the first of a four-unit series on computer literacy, provides general guidance on establishing and conducting computer literacy courses, whether as components of other courses or as free-standing courses. An overview of computer literacy in the context of education and training and of guidelines for its implementation is followed by a discussion of the resources needed for conducting courses, including hardware, software, audiovisual resources, facilities, and staffing. Suggestions are offered for initial, continuing, and integrative staff development. A description of 57 teaching modules developed to implement computer literacy aims and objectives includes a list of the modules in 10 categories: introduction; computer basics; understanding programs; business, office, industrial, and other applications; social implications; visits; and assessment. Care modules are denoted by an asterisk and a step-by-step guide to module use is provided. Class management strategies are described for two of the teaching modules, "Writing a Program" and "Using a Business Package." A final discussion on assessment describes a strategy that has been incorporated into the course and summarizes the strategy's effectiveness and resources required for its implementation. Appendices include a list of colleges associated with the sponsoring project and a glossary of computer terms. (LMM)

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ED253203

A Staff Development Publication

October 1984

COMPUTER LITERACY 1

UNIT ONE

GENERAL GUIDE

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A Staff Development Publication

COMPUTER LITERACY

UNIT ONE

GENERAL GUIDE

Jo Lloyd, James Taylor and **Chris West**

Gloucester College of Arts and Technology

With contributions from:

Cambridge College of Further Education,
Southgate Technical College and
Worthing College of Technology

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Dear Sir/Madam

COMPUTER LITERACY: UNIT 1 - GENERAL GUIDE

I enclose herewith, one of the four Units associated with a project on Computer Literacy, carried out on our behalf by the Gloucestershire College of Arts and Technology (GlosCAT). This is an extended and updated version of Part I published in November 1983.

This Unit is primarily aimed at those who are responsible for the provision of Computer Literacy, (Units 2, 3 and 4 provide more detailed guidance and support material for teachers). The attached Unit contains an outline definition, relates this to existing curricula, gives guidance with respect to hardware, and describes the resources, skills, support and staff development recommendations that appear to be necessary for the effective provision of Computer Literacy. The considerable extent to which the FEU has been able to agree with this advice is described in the Preface.

We hope that the report will be accepted as an important document. A main theme is that Computer Literacy is a basic skill which all teachers should be capable of teaching as an integral part of their subject teaching. The project team proved that, provided adequate support was given, this was not only a desirable but also a practical aim. This Unit, and its companion Units attempt to provide some of that support. The information given can be regarded as a direct contribution to the new CPVE core curriculum and complementary to MSC material supporting its work-based YTS scheme. We hope however, that the FE sector will acknowledge its wider potential by including Computer Literacy in all its curricula, making it available to adults and young people alike.

Yours faithfully

Jack Mansell

JACK MANSELL
Chief Officer

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Preface

i. This is an important document in an obviously important field. The ability, or lack of it, in using a microcomputer will, for the next two decades at least, identify our age group and/or our talent for keeping up to date. This applies corporately as well as to individuals, and the credibility of the further education sector will in no small way depend on the speed with which colleges and their staff come to terms with IT, of which computer literacy is a major part.

ii. This report aims to assist the FE system to understand the concept of computer literacy and to make it an essential part of the FE curricular provision. In a previous report on skills*, the FEU has suggested that all FE teachers should be teachers of basic skills. Both the MSC and the FEU have defined computer literacy as a basic skill; the implication for all teachers, their managers and advisers, is therefore clear.

iii. This is a revised version of the report initially published in 1983. It now comprises four Units: Unit 1 is a General Guide for providers and teachers; Units 2, 3 and 4 provide detailed teacher support material for essential core modules, for additional core modules and for vocationally specific modules respectively. Further details are given on the back cover of this volume.

iv. As with *Basic skills*, the FEU realises that we are in a situation where much of the terminology of education and training is, rightly, being radically re-defined. If better and wider education/training opportunities are to be provided for more people, then we need to critically appraise the extent to which our existing terminology restricts opportunity. With a new area of knowledge and expertise such as that presented by IT and computer literacy, we have to be careful not to perpetuate constraints and inequality of learning opportunities by adopting restrictive definitions and inappropriate stereotypes of ability.

v. The definitions of computer literacy used in this report therefore are supported by the FEU because they do not imply restriction of access. Indeed the support material has been trial-tested with students representing a wide range of (conventional) ability and age. In adopting these definitions we are confident that we are associating ourselves with a type of curricular provision that should be made available to everyone. Quite obviously, as with all skills, some learners will prove more adept than others; but the connotation of computer literacy as an educational opportunity that should be available to all, is one which we firmly support. The experience of the colleges who helped to test the material generally confirms that computer literacy can be regarded as an everyday skill available to everyone. Like

Basic skills. FEU, 1982

all skills, it decays if it is not taught and learned thoroughly, and if it is not practised and updated from time to time. The introduction of computer literacy into schools therefore, does not absolve the FE system from responsibility for the further development of this skill for young people and adults.

vi. There is a high degree of compatibility between the definition of computer literacy that is supported in this report and that adopted by the MSC for its YTS programmes. Those discrepancies that do exist are relatively minor and relate largely to the nature of programming required. Units 2, 3 and 4 in particular therefore should be useful to teachers and tutors associated with any scheme of vocational preparation, whether work or college-based. Of equal importance, the material in these Units should enable teachers to introduce computer-based skills and techniques into their existing subject teaching. The design-base of computer literacy in this report rests upon a core of 28 modules, plus a selection of optional and more vocationally specific, modules. Teachers and tutors will wish to choose for themselves how they organise the learning of these modules and appropriate guidance is given in the report, but the FEU, in supporting the definition espoused in this report, hopes that all students/trainees will have the opportunity of experiencing at least the core modules. For most students this represents some 30 hours of work – not an excessive period if one considers the potential disadvantages of being computer illiterate.

vii. Valuable information on resources and hardware is contained in the four Units of the report. The authors suggest that, for computer literacy courses, the BBC model B microcomputer may be the 'best buy', but suitable alternatives are given such as Research Machines 380Z, Link 480Z, Sinclair Spectrum. It is appreciated that many colleges are not starting from scratch, neither are their needs necessarily solely related to computer literacy. Indeed where teachers are, through this computer literacy material, introducing computer-based techniques into mainstream subjects, other machines may well be preferable. It is hoped therefore that this information will be accepted as useful guidance for those who wish to note it, rather than as a prescription from the FEU.

viii. Much the same applies to the resources required to support computer literacy programmes. There is no lack of experience to show that too many excellent educational schemes fail because they are not adequately resourced and supported. Too few machines could deter otherwise willing teachers from commitment to the task of providing computer literacy for all their students. Inadequate technical support and software can similarly frustrate both teachers and learners who are willing to have a go. As indicated in paragraph ii above, the FEU believes that all teachers should be able to teach computer literacy. The quid pro

quo is a reasonable level of support; and again we hope that the advice given in this report with respect to resources, staffing and training – based as it is on experience – will be accepted as postive guidance rather than an FEU prescription.

ix. Unit 1 relates computer literacy to many of the existing curricula in this area. This section will inevitably date as the major Examing Boards generate more schemes. The problem for colleges however, is to ensure now that time is available to provide this essential skill for all students. This requires a college policy, commitment and probably a re-allocation of time between and within subjects. Local rather than national decisions are necessary. All this report can do is provide a framework for those decisions.

x. In all Units, but particularly in Units 2, 3 and 4, guidance is given to teachers with respect to the content, teaching skills and attitudes that have proved to be useful in getting to grips with this subject which must be new to most of us. The Units contain a significant amount of teacher support material, including guidance with respect to assessment and software, which has implications for the training of teachers and support staff. The authors maintain that "the levels of computer expertise needed by staff can be provided in a relatively short time". This is good news; and it is no accident that we have designated all volumes as Staff Development publications.

xi. We can only reiterate that, by describing computer literacy as a basic skill, we mean that all have the right to acquire this type of literacy. The responsibility of all teachers to contribute to the acquisition of this skill, must be for many one more extension of their professionalism. The alternative is to define computer literacy as a restricted skill and subject, taught only by 'expert' teachers, to a selected group of students. For a new area of competence, so universally applicable, this would be nothing short of an economic and educational disaster.

xii. Finally, the FEU Board of Management would wish to place on record its appreciation of the colleges that contributed to the report. In particular our thanks are due to the Gloucestershire College of Arts and Technology who so willingly supported Chris West and his team in what was obviously a demanding project. The reception of the first edition of the report was an adequate testimonial to their effort and we are happy to reprint further editions.

The FEU is committed to the maintenance of the project by GlosCAT, and perceptive readers will notice that within the report there is offered a modest software service.

JACK MANSELL

The Computer Literacy Units

The Computer Literacy report is divided into four Units, each of which is available separately. The Units are as follows:

Unit 1 – General Guide

This is intended to give general guidance, both to those providing computer literacy courses in colleges (Principals, Vice Principals, Heads of Department, and others engaged in the management function) and to the classroom teacher who is looking for advice and support. It contains an overview of computer literacy in the context of education and training schemes, an introduction to the teaching materials contained in the other Units, and resource and staff development recommendations. Guidelines are also given for class management strategies and assessment methodology.

Unit 2 – Core Materials

This is intended for the classroom teacher, and is made up primarily of teaching modules and supporting materials. Twenty-eight modules are provided, each one intended to cover approximately one hour of a computer literacy course. Each module is defined in terms of learning objectives, and is structured into Memory – Understanding – Doing – Strategies/Activities. The modules are accompanied by supporting materials; these can take the form of hardware or software recommendations, worksheets, suggestions for projects, or similar documents. The modules in this Unit together provide a course which should allow those taking it to achieve the computer literacy objectives which also form a part of this Unit. It is recommended, therefore, that these modules and the areas of computing which they cover form a necessary minimum in any computer literacy course. For this reason, they have been designated as core modules.

Unit 3 – Further Computing

This is of a similar format to Unit 2, but containing additional teaching modules and supporting materials. The twelve modules contained in this Unit cover additional material in the basic areas of how computers work, the background to their development, and knowledge of computer programming. These modules would not be expected to form part of a standard computer literacy course, but would be

available for groups with an interest in developing further knowledge and skills in any of these areas.

Unit 4 – Vocational Options

This is also of a similar format to Unit 2, containing vocationally specific teaching modules and supporting materials. The seventeen modules contained in this Unit cover additional applications of computing in industry, commerce, and a variety of other areas. Like the materials in Unit 3, these modules would not be expected to form part of a standard computer literacy course, but would be available for groups with an interest in developing further knowledge and skills in any of these areas.

Chapter 1
Introduction

1.1 This document is the first Unit of a four-Unit series of booklets on computer literacy. A brief description of each Unit precedes this Chapter.

This Unit in the series, as its name suggests, is intended to give general guidance on setting up and running computer literacy courses, whether as components of other courses or as free-standing courses. The target group has been planners and teachers engaged in the provision of computer literacy schemes in the pre-vocational and other areas, and it is hoped that the flexible way in which the materials are presented will allow schools, colleges and training agencies to make the maximum possible use of the scheme.

1.2 All users should familiarise themselves with the contents of this Unit before going on to build up a detailed computer literacy scheme from the materials in Units 2, 3 and 4. This Unit gives general guidance in the following areas:

i) The definition of computer literacy, in terms of educational and training objectives, together with a broad-based review of the need for computer literacy, its place in the curriculum, and guidelines for its implementation;

ii) The resources needed for running courses, covering the areas of hardware, software, audio visual resources, accommodation and staffing. Difficulties are discussed and general recommendations are made. (Some of these resources are described in more detail in Units 2, 3 and 4, when they are recommended for use with a particular teaching module);

iii) Staff development in this area of work, together with suggested ways in which this can be provided;

iv) The materials which make up the scheme of computer literacy, with a list of the modules available in the other three Units and a step-by-step guide to their use;

v) Class management strategies which have been found effective in teaching computer literacy. This is illustrated by using two of the teaching modules as case studies and showing how they have been used effectively in the classroom;

vi) Assessment strategy, together with a description of the strategy which has been built-in to the course and a discussion of its effectiveness and the resources needed for its implementation.

Chapter 2
Definition and Implementation

What is computer literacy?

2.1 Computer literacy is a term which evolved in the early 1980's with the advent of the BBC Computer Literacy Project and the development of the computing content of various core curricula in vocational preparation schemes. A full definition has been developed in this FEU Computer Literacy Project, and is given in summary and in layman's terms as follows:

(i) Understanding what computer systems are,

(ii) Usage of computer vocabulary,

(iii) Operating a computer in a work related situation,

(iv) Appreciating what a program is and why it works,

(v) Being aware of applications of computing in commerce, industry and other settings,

(vi) Being aware of current trends in information technology and its social implications.

A full definition in terms of educational and training aims and objectives is given on pages 4–7.

A discussion of this definition

2.2 We need to know something about how computers work and the vocabulary associated with them before we can use them. This includes an understanding of the functions and relationships between the main parts of a computer system (i.e. disc unit, processor, memory keyboard, printer).

The learning of operational skills should take place in a work related situation (or at least in the context of using the computer to perform a useful task). Examples of such applications are the use of simple word processing, spreadsheet or database packages. All of these examples have now been used to help impart computer literacy.

It should be stressed that the inclusion of an appreciation of programming means a minimal experience and that the implementation of this can be achieved in a variety of ways. It does not necessarily mean the writing of programs in BASIC. The rationale for including programming is that to fully understand and to confidently use pre-written software packages demands an appreciation of how that package has been produced and its potential vulnerability. A demystifying of what would otherwise be a black box has proved successful and has gained almost unanimous support in our field testing and evaluation.

At the same time the recent availability of the languages PROLOG and LOGO on microcomputers means that programming can be introduced in rather more painless and interesting ways as an alternative to BASIC. (PROLOG and LOGO are languages which are based on mathematical logic and are nearer to everyday 'human' expressions of problems whereas BASIC, although the universal language of micros, is more influenced in its structure by the hardware).

A wide awareness of computing applications in commerce, industry and other settings is an aim which could get lost in specific training courses geared to a particular career path. This project seeks to give a wide awareness to all trainees. Again, an awareness of current trends in information technology and its social implications (particularly effects on jobs) needs to be included in any computer literacy programme. It is in these latter two aims that training and education cannot be divorced if students are not to lose sight of the context in which they are working.

A fuller definition of computer literacy, in terms of student based aims and objectives is now given and the appropriate aims and objectives are listed at the beginning of each module.

Aims and Objectives

Aim 1	To acquaint the student with the nature of computer systems and the associated terminology
Objectives	The student will be able to:
(Core)	(i) use a simple predefined computer vocabulary, both verbally and in writing;

	(i)	list the basic elements of a computer system and state their functional relationship to one another;
	(iii)	recognise and distinguish between mainframe computers, minicomputers and microcomputers (in terms of relative size and characteristic uses);
	(iv)	recognise and state the function and importance of a microprocessor;
(Subsidiary)	(v)	trace the historical development of computing;
	(vi)	explain the functions of the units within a computer and how a communications link operates;
	(vii)	recognise and distinguish between the different ways of holding data on a computer;
	(viii)	distinguish, by example, between digital and analogue devices.
Aim 2	To familiarise the student with a range of computer equipment and enable him/her to use specified items with confidence	
Objectives	The student will be able to:	
(Core)	(i)	identify and state the function of the central processing unit and the major computer peripherals;
	(ii)	use a computer keyboard to perform a simple task;
	(iii)	operate a specified microcomputer or visual display unit and use named facilities;
	(iv)	load a pre-written program from backing storage and use it to perform a set task;
(Subsidiary)	(v)	connect and successfully operate analogue and digital devices interfaced to a microcomputer;

		(vi) use a graphics terminal to perform a specified task.
Aim 3	To develop a practical appreciation of the nature of computer programs and their method of operation	
Objectives	The student will be able to:	
(Core)		(i) identify the function of and need for software;
		(ii) illustrate a logical sequence of instructions by drawing a flowchart or by another appropriate method;
		(iii) read and amend a program;
		(iv) from a specification provided, write, input, run and save a simple program involving input, processing and output;
(Subsidiary)		(v) list three programming languages and describe the types of applications for which they are most suitable;
		(vi) develop and test a specified project program.
Aim 4	To acquaint the student with a range of uses to which computer technology is put in industry, commerce and other settings	
Objectives	The student will be able to:	
(Core)		(i) describe a specified number of applications of computer technology in the areas: (a) Industry (b) Commerce (c) Other settings such as education, the media, public sector, in the home;
		(ii) use a device incorporating micro-electronic control to perform a set task;
		(iii) use specified computer facilities in either a commercial setting or in a model business situation;

(iv) use computer facilities relevant to an application outside commerce and industry;

(v) use a commercial teletext or viewdata system;

(Subsidiary) (vi) use a computer package as a tool to facilitate decision-making.

Aim 5 To familiarise the student with current trends in information technology and with the social implications of its widespread use

Objectives The student will be able to:

(Core) (i) identify and describe a specified number of the main areas of information technology in use or under development, (e.g. database systems, graphics and simulation, networking, artificial intelligence, industrial robotics, etc.);

(ii) describe a specified number of the social implications of information technology for work, leisure and the home;

(iii) realistically assess his/her potential for obtaining employment with the skills developed in the computer literacy course.

Aim 6 To increase the student's ability to benefit from education and training based upon or allied to CAL (Computer Assisted Learning).

This aim will be achieved through many of the objectives stated under all the aims described previously.

2.3 Information technology (IT) is a term which is now widely used in public life and has a variety of definitions. The FEU, in their IT policy document *Information technology in further education* define IT as follows:

IT is the acquisition, production, transformation, storage and transmission of data by electronic means in forms such as a vocal, pictorial, textured or numeric, such as to facilitate the interaction between men and between men and machines. It also includes applications and implications (social, economic and cultural) of these processes.

Thus computer literacy can be seen as a basis for the wider study of information technology.

Why computer literacy and information technology in FE curricula?

2.4 Computer Literacy is seen as a first essential step in the use of Computing as a tool across the curricula. It is part of the common core recommended for all vocational preparation schemes. (*A basis for choice*. 2nd Ed. FEU, 1982). From this common core, computer applications in specific areas can then be developed. Without a common core approach of computer literacy, basic computing skills would become less available for integration with other subjects in the parent scheme.

Computer literacy/information technology now form part of the common core recommended for the YTS – Youth Training Scheme, CPVE – The Certificate of Pre-Vocational Education (Consultative Document B/TEC & CGLI May 1984) and TVEI schemes – Technical and Vocational Education Initiative for 14–18 year olds.

Evaluation has shown that computer literacy has enabled students to cope confidently with the technology when they have encountered it in its various forms at work and home, and to adopt a considered view of its social implications. Thus computer literacy should be integrated with the other areas in vocational study as is emphasised in the aims. It has enhanced their employment potential, particularly in small business where the need is for the possession of a wide range (but not necessarily depth), of microcomputing and other skills. It has opened the door for vocational preparation students with identified potential in IT to pursue further FE qualifications and hence obtain higher quality jobs. It is heartening that it is through computer literacy that an otherwise hidden potential is identified.

In evaluating these materials with adults ranging from TOPS Adult Preparation Students to MSC employees and trainers, it has been found that, given appropriate intensification of the programme, adults quickly become computer literate, and therefore confident in relating to the computer world at all levels.

Certification of computer literacy

2.5 In implementing schemes such as YTS, given that computer literacy has identified potential in trainees for further study in Information Technology, a strong

need for certification of computer literacy skills has emerged. This would enable students to progress to FE computing courses such as those offered by B/TEC. Examples of current initiatives towards certification are:

(i) The development of a 'Basic Skills in Computing' Certificate by AEB and;
(ii) The modification of the Computer Literacy Certificate by CGLI, and the development of 'bolt on' modules in certain applications areas.

It will inevitably take time before such certification can be made fully available. Some local initiatives have also been made. Examples of such initiatives are The Croydon Certificate of Computer Competence and the Milton Keynes Diploma in Microcomputer Applications. The RSA have developed a computer literacy and information technology scheme in conjunction with the Milton Keynes Industry-Education Liaison. RSA have also produced, in conjunction with MEP, and the National Computing Centre, a multi-media package – 'Information Technology in Business'.

Implementation of computer literacy

2.6 To facilitate implementation of computer literacy, the project team have developed a modular teaching scheme together with assessment, resource and staff development recommendations which are fully described in the following chapter. This modular scheme was tested by a number of colleges in the academic year 1982/1983 and published in the first edition of this report in December 1983. Evaluation to date has shown that the scheme has proved useful both when implemented in detail and when the same ideas are implemented using locally developed materials. Much enthusiasm has been evident in FE establishements in implementing computer literacy in YTS Schemes. FE colleges have been very active in providing computer literacy for External Managing Agents of YTS schemes. The modular scheme comprises:

(i) 28 core modules, which cover all aspects of the definition of computer literacy and are detailed in Unit 2 of this guide;

(ii) 29 additional modules, which cover further computer basics and programming (Unit 3) and further vocational options in Business and Industry (Unit 4).

Resource recommendations covering hardware, software, staff (technician and teaching) and audio visual resources are detailed in Chapter 3 of this Unit. It is essential that appropriate educational hardware systems are provided. The recommendations in this publication are consistent with the DTI recommendations for schools but it is also recognised that FE colleges may have invested in systems outside this range.

A survey of information technology in FE (FEU April 1984) revealed that overall IT provision in FE was patchy; the need to provide IT for YTS was having a greater impact than the major FE examining bodies through mainstream courses. An FEU IT Policy document has been issued identifying areas in which the FEU with its limited resources will support IT in FE and gives guidelines for college policy where none exists.

Resources – the key issues

2.7 The recommendations in this report represent minimum requirements. It is important in a climate of cuts to note that computer literacy resources can be used with all levels of students and that FE colleges should do their utmost to use microcomputer resources to generate income by fully utilising them for self funding courses. It is important to recognise that the major resource provider for computer literacy courses is the Local Authority and the Government has recently announced the allocation of £13 million for IT in NAFE as the major part of the first Education Support Grant, to be bid for by LEA's. It is expected that £10 million will be spent on hardware, £1.5 million for courseware and £1.5 million for staff training.

As computer literacy schemes become established, the need to progress beyond the core becomes a reality and together with this, a move towards applications which are more demanding on hardware capacity and capability. It should be noted that at this point the finite capabilities of microcomputer systems are likely to be stretched and that a demand for more powerful systems may then become evident. The ideal solution for such problems would be microcomputers acting as intelligent terminals in a mainframe/mini network environment. It is unlikely that such systems will be immediately within the reach of most FE colleges financially, but the applications demand needs consideration.

A summary of resource costs is given in the check list for action on pages 13–14.

Hardware

2.8 The aims and objectives of the computer literacy course must be supported by sufficient and appropriate hardware. Ideally this means 1 workstation to 1 student. (A workstation comprises a key-board, processor, monitor, access to disc or cassette unit and optionally a printer). Evaluation has shown that 1 workstation to 2 students is a satisfactory and potentially advantageous ratio in that students can learn from each other, thus rapidly increasing confidence. The BBC model B micro-computer has emerged as a robust, versatile and cost-effective microcomputer for computer literacy teaching. The Sinclair Spectrum and Research Machines 380Z and Link 480Z are also appropriate for this purpose and other low-cost microcomputers coming include the Sinclair QL and the Amstrad. It is also recognised that Colleges and Training Agencies may have already set up other resource bases which can be developed for computer literacy purposes.

Discs

2.9 Evaluation has reinforced the obvious advantages of disc storage over cassette storage and this is now widely accepted. This is particularly important to maintaining the motivation of low ability students. Given a student class size for YTS of 15 then the cost of the minimum requirement of 8 workstations would be £7,200 for a disc based system. (July 1984 prices, based on 2 students to 1 workstation). Printers (£200 extra) are necessary, but it is not vital to have one per workstation. By use of a simple device, 4 microcomputers can be linked to one printer.

Local area networks

2.10 Consideration should be given to the use of local area networks, whereby workstations can be linked to a disc file server and printer. A summary of Torchnet and Econet for the BBC microcomputer and of the Research Machines network is given in Chapter 3 of this Unit. FE colleges are gaining increasing experience in the use of local area networks. The cost advantages and ability to share software and simulate electronic mail have to be weighed against the initial difficulties of implementing such systems in terms of the teaching staff familiarising themselves with the comments and style of operation and the degree of technical support required. Typical costs are £8,946 for an 8 station ECONET network.

2.11 Providers should also budget for supporting hardware in the form of low cost robotics and design aids. Examples are:

The BBC Buggy – a control and sensing device

The Edinburgh Turtle (two versions) – a control/design device

The PL Digitiser

The Android Robot Arm

Graphics Tablets and bit-sticks

Software

2.12 Software has been developed for this computer literacy scheme and is recommended, together with a selection of commercially produced educational software. There is an amount of good user-friendly commercially available software outside the CAL or Games area. GlosCAT software has been written and tested on the BBC micro but, with the exception of those using Graphics facilities, the programs are transferable to other machines. A set of essential commercially produced software covering the areas of word processing, database and financial modelling is recommended, at a cost of approximately £90. A number of other initiatives to produce and evaluate software appropriate to this are in progress. A FEU publication, by Christine Disney, evaluated software for the Business Studies area.

Audio Visual Resources

2.13 Video tapes and slides form an essential component of this computer literacy scheme. Facilities for using them need to be available.

Accommodation

2.14 A dedicated room for teaching the core of computer literacy, with a minimum of 8 workstations (for a teaching group of 15), audio visual resources and a technician are essential. Computer literacy modules integrate the use of microcomputer facilities, video tapes, exposition and assessment within single sessions. Transferring students to AV facilities during a session or bringing

equipment in is an undesirable barrier to motivation and an inefficient way of achieving objectives.

As core skills, such as computer literacy, are being taught increasingly within application areas there is a need to provide computer equipment in labs, workshops, office training centres etc., and to integrate the core with these areas.

Staff Resources

Teaching

2.15 Computer literacy teaching staff need not be Computer Specialists (who are in short supply) but ideally should be teachers with skills in other areas to which computer literacy can be related. Computer literacy is for all. The consequence of this is that all teachers will be required to become computer literate. Evaluation has shown that by using appropriate staff development strategies, teachers from a wide variety of backgrounds have been successful in teaching computer literacy. It should be noted that computer literacy is demanding on teaching skills, for example, in motivating vocational preparation students towards technical competence and at the same time imparting an awareness of the technology.

Technicians

2.16 Technician support for computer literacy teachers is essential. Requirements, and a strategy for technician development and provision, are given in Chapter 4 of this Unit. Teachers should not be expected to keep the equipment in running order and maintain software libraries but should be left free to concentrate on the achievement of computer literacy objectives. This is in common with any equipment based subject.

2.17 In setting up computer literacy courses, it is easy to underestimate the lead times needed for resource purchase and staff development. Current pressures to mount these courses quickly could lead to an interim lowering of quality. It is hoped that this report will provide support to minimise the problems of implementation.

Checklist

2.18 The following table is a checklist for action for computer literacy providers. It gives approximate costs for a facility which will accommodate up to 15 students at the recommended ratio of 2 students to 1 workstation.

A reference is given for each item in the checklist to enable providers to examine further details given in the report.

HAVE YOU?	COST		REFERENCE
a) Provided sufficient hardware	BBC (Disc-based) Econet		Page 15
Supporting Hardware (robotics and graphics)		£500 approx.	
and Software	Project software Other essential software	Free £90 approx.	Page 18
b) Provided a dedicated room with adequate 13 amp points			Page 21
c) Provided single specialist workstations in laboratories, workshops, office training centres.		Variable	Page 21
d) Provided Audio Visual Resources (Video playback and slide projection facilities)	Normally available as central college resource		Page 20
e) Recruited and developed lively, flexible and confident teaching staff			Page 25
f) Provided and trained a technician	£3,000–£6,000 p.a.		Page 23
g) Selected material (core and non-core) appropriately integrated with the parent course			Page 36
h) Selected an appropriate assessment strategy			Page 49
i) Provided mechanisms for visits	Transport costs		

2.19 Evaluation has clearly affirmed that the key ingredients are adequate resourcing and enthusiastic staff, supported by a committed management.

Chapter 3
Resources

3.1 This chapter aims to give guidance to management on the characteristics and quantity of equipment which is desirable for implementing computer literacy schemes. It should give teachers/trainees a basis for negotiation with their management for the provision of appropriate equipment. This review of resources is not intended to be exhaustive. There are now a plethora of possible resources and examples of those which have proved to be useful are given here.

Hardware resources

3.2 The student to machine ratio recommended is at worst 1 work station (keyboard, computer, VDU) to 2 persons. There is some evidence that validating/funding bodies are requesting a 1:1 student to work station ratio. 2 persons to 1 work station can be used advantageously in that the two people can support each other in the learning process.

3.3 The following machine configurations have been found to be suitable for computer literacy. All costs quoted are approximate, as quoted for the educational market in July 1984:

Single Work Station
The BBC Microcomputer

BBC Model B + disc interface	£385
Colour Monitor – Microvitec 1431	170
Disc drive – 100K 40 track Cumana with power supply	137
Epson RX80 Printer	200
TOTAL	£892

Research Machines Link 480Z

Link 480Z L2	£483
MD-1 Single Disc Drive	399
Colour Monitor TT1 RGB	199
Epson RX80 Printer	200
TOTAL	£1,281

Local area networks

3.4 Economies on software purchases, disc units and printers can be achieved by having single disc units and printers networked to microcomputers using local area network facilities. Three commonly available systems are described here:

ACORN ECONET SYSTEM		
10 BBC Model B microcomputer with Econet Interface		£4,210
10 Station lead set and cable		106
Terminator Box		29
Clock Box		37
File Server Level 2 80 Track		206
Printer Server Eprom		40
Tracking		40
User Guide		9
Printer		200
10 x Colour monitors		2,000
	TOTAL	£6,877

TORCHNET SYSTEM		
4 x BBC/280 + ECONET and twin disc drives		£4,676
6 x BBC/280 card + ECONET		4,252
Network		391
Cable etc.		105
10 x medium resolution colour monitors		2,139
1 x printer		437
	TOTAL	£12,000

LINK 480Z NETWORKS

There are two options:

(a) RML Shared disc system – a disc-based LINK 480Z system is the 'HOST' and a number of LINK 480Z 'Guest' systems can access the disc on the HOST

Sample costs – 4 workstations

4 x LINK 480Z System L2 (£483 each)		£1,932.00
1 x MD – 2 Disc Drive		648.00
4 Colour monitors	(£199 each)	796.00
Cable, connectors and software		59.20
	TOTAL	£3,435.20

(b) CHAIN NETWORK

Up to 16 LINK 480Z Systems can be connected to a central server to form an RML chain network. The server supports floppy discs and, optionally, Winchester discs (up to 80 Mbytes).

Sample costs – 6 workstations

1 x MDS Network Server		£1,735.00
1 x 20 M/byte Winchester Disc Drive		2,495.00
6 x LINK 480Z System L4		3,510.00
6 x Colour Monitors	(£199 each)	1,194.00
Cable,		78.60
	TOTAL	£9,012.60

A networking facility for the Sinclair Spectrum is also available.

Additional hardware items required for core modules

Big Trak (Toy) Tank M & B	£ 29.00
BBC Buggy	189.00
(low cost control, sensing and graphics device)	164.00
*Edinburgh Turtle	350.00
, Access to Prestel/Teletext	

To keep costs down it is recommended that Colleges invest in centralised PRESTEL facilities in libraries or that a Teletext demonstration is arranged through a local T.V. dealer.

Additional hardware items appropriate for non-core modules

Powertran robot arms	from £150.00 to £1,100.00
PL Digitiser	80.00
Acorn Bit stick (Joystick)	
Graphic Tablets (a range)	

*A smaller size is also available

Software resources

3.5 During the course of the project, involvement with software has taken two forms:

(a) developing purpose built software to support computer literacy courses, and

(b) evaluating commercially produced educational software for its suitability for the courses developed. These are dealt with in turn.

Software development

3.6 Programs have been written in BASIC to run on the BBC microcomputer, although they may be easily converted for other machines. They have been consentrated in three main areas:

(i) Introductory programs
These are intended to help the student in his first familiarisation with the use of a computer;

(ii) Applications software
These programs introduce the students to the role played by the computer in business, industry and other settings;

(iii) Computerised check-tests
It was found that most students enjoyed being assessed using computerised question-and-answer sessions and were capable of learning through this activity.

This software is documented in Units 2, 3 and 4 of this report. A limited disc copying service is available for BBC Micro users. Details of this service are available from:

The FEU Computer Literacy Project Office,
Gloucestershire College of Arts & Technology,
The Christchurch Centre,
Gloucester Road,
Cheltenham,
GL51 8PB

Recommended commercially produced educational software

3.7 Software has been obtained from the following sources:

(i) specialist computer magazines,

(ii) computer manufacturers,

(iii) computer user groups,

(iv) MEP*

(v) other users/colleges.

A very limited amount of such software is useful for computer literacy courses. A good proportion of currently available software is for computer assisted learning, which is distinct from computer literacy. In the case of the BBC Microcomputer, a minimum set of this software could comprise:

WORDWISE	– Word Processing Package	£39.00
BEEBCALC	– Financial Spreadsheet	£34.00
VU-FILE	– Data base	£14.95

It should be noted, however, that many other software packages of this type are now available, and may be as effective as those given above. 'Follow-up' lists of software and other resources which are available commercially are given with the detailed teaching materials in Units 2, 3 and 4. The list given above is not intended to be prescriptive.

A range of suitable software is available for the LINK 480Z.

Research Machines offer a network package to colleges at £395.00. This package includes WORDSTAR, PASCAL, TELESOFTWARE, QUEST (database) TEXT EDITOR, LOGO, BASIC, SIR, TOUCH N GO, COBOL, MULTIPLAN (spreadsheet) and FORTRAN which should meet the computer literacy, Business Studies and Computing Science needs of a typical FE College.

*With respect to software required beyond Computer Literacy in FE, the FEU have compiled a useful guide to appropriate MEP software (*Microcomputer materials from MEP*, January, 1984).

Similar packages are available at lower costs for stand-alone systems.

The Torch-BBC network system TORCHNET will support CP/M software such as WORDSTAR, SUPERCALC and DBASEI for professional use. (CP/M-Control Program Microcomputer is a standard operating system for business microcomputers).

Torch also have their own standard software:

Perfect Writer	(Word Processing)
Perfect Calc	(Spreadsheet)
Perfect Filer	(Database)

Audio visual resources

3.8 The major AV resources recommended are video recordings of selections from the BBC TV Series

The Computer Programme
Making the Most of the Micro
Managing the Micro
The Electronic Office

These are documented fully in COMPUTERFAX, a BBC/OPEN UNIVERSITY newspaper publication.

Selectivity is vital here and appropriate selections from these series are documented fully with the modules in Units 2-4. Access to video playback facilities in the computer literacy room is recommended.

3.9 Slides are the other main AV resource. GlosCAT have produced a set of slides of local applications. It is recommended that other users of the scheme do the same since the local flavour of applications will provide motivational impact. An alternative is to use selections from the PRISMATRON slide/tape series £300.

3.10 An overhead projector is a necessity for teaching computer literacy. Some modules specifically require OHF use. A white board is preferable to a black chalk board to reduce the level of dust in the computer literacy room.

3.11 A further necessary aid is a microscope and chip.

Accommodation

3.12 A dedicated room is a necessary prerequisite for the implementation of the core computer literacy course. The above Hardware and AV resources should all be permanently available in the room, which should have ring main – ideally with floor sockets. Two alternative layouts which have proved successful are shown in the diagrams overleaf.

This recommendation refers to the implementation of the computer literacy core within a variety of vocational preparation schemes in FE. It should be noted that computer literacy should be fully integrated with the rest of the curriculum and therefore computer facilities for more specialist application should be provided within technical/business areas, i.e. in laboratories, engineering workshops, office training centres. The extent to which core and specialist facilities can double up depends entirely on the context and size of schemes and their environment, e.g. FE colleges serving a range of vocational preparation schemes will always need dedicated core facilities and specialist facilities while a small privately managed YTS scheme in, say, the clerical area could incorporate the core within a training office facility.

Useful reference to these activities may be found in the paper *Towards the electronic office* by Christine Disney (FEU 1983).

3.13 Security is an ever present concern. Three successful modes are:

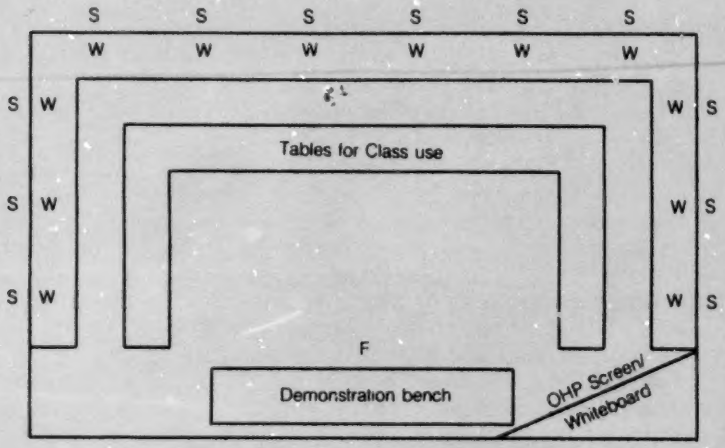
(i) alarm lock fitted to door and windows of room which is only unlocked when staff are present;

(ii) loop alarm system used with open access arrangements;

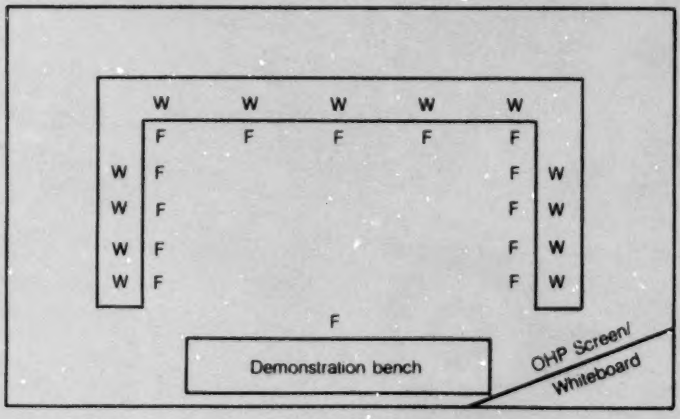
(iii) normal locks but grills fitted over doors and windows. Room only used under staff supervision.

3.14 Supporting resources include a collection of computer based items such as Kimball tags, bar coded objects, slips from cash machines. A collection of appropriate magazines and posters will help to create a motivating and informative environment.

S denotes 3 pin wall socket



F denotes 3 pin floor socket



(The use of specialist microcumputer trollies rather than desks can be used to aid in the flexibility of the layout)

Appropriate magazines are:

BBC User
Acorn User
Micro Decision

IT82 and MEP have proved useful sources of posters.

STAFF RESOURCES

Technician staff

3.15 The provision of a technician to support a dedicated comp :ter literacy facilities is seen as an essential requirement. The duties of the technician are iisted as follows:

- 1st level maintenance of equipment,
- taking equipment to local maintenance centres (or arranging for maintenance),
- maintenance of a computer literacy software library,
- commissioning new equipment,
- helping staff and students with operational problems,
- maintaining the security of hardware and software,
- maintaining a stock of supporting material,
- maintaining a stock of hand outs, and,
- if neccessary, writing and documenting programs to staff specifications.

In FE colleges the difficulty of obtaining funding for technician support in non-traditional areas is as well known as is the possible overmanning of traditional areas now in decline. It is firmly recommended

(i) that positive attention be given to redesignating technician support within colleges with consideration to the needs of computer literacy.

(ii) That the use of external funds for technician support be considered. A strategy which has functioned well in several colleges during evaluation has been to use HND Computer Studies Sandwich Year Students on Industrial Placement as temporary technicians. There are advantages on both sides here in that the college/Training Agency gains a person who is sufficiently young to relate well

to students while having one year's appropriate training and generally good motivation, at a reasonably low cost (£3,000–£4,000); while the HND student gains a wide range of valuable experience which in some cases develops his interpersonal skills to a greater extent than would a programming placement in industry.

If Technicians need to be trained or re-trained, the following strategy is recommended:

(i) A core computer literacy course as in this document,

(ii) an Acorn BBC microcomputer maintenance course.

Teaching staff

3.16 The availability of motivated staff with the necessary computing and teaching skills is seen as a key requirement for the successful implementation of computer literacy schemes. Chapter 4 looks at the issues which this raises and the need for an effective staff development strategy for this area of work.

Chapter 4
Teaching Staff

Teaching requirements

4.1 The successful teacher of computer literacy will need to have i) a certain level of knowledge of computers and computing, together with the necessary practical skills of computer operating and programming, and ii) a range of teaching skills appropriate for pre-vocational students. There is a need for development strategies which recognise the presence or absence of characteristics (i) or (ii).

Teaching skills and attitudes are important when dealing with students on pre-vocational courses, rather than an expert computing knowledge or skill. A strongly favourable attitude towards students, a concern for their individual success, and a positive motivation towards involvement in the course are essential. The significant teaching skills needed are those of motivating the students, together with the related interpersonal skills. However it is essential for the teacher to reach a threshold level of competence in all skill areas before undertaking the teaching of computer literacy.

Staff development

4.2 Considering the attributes of successful computer literacy tutors leads to a discussion of Staff Development needs. These can be divided into 3 areas:

(i) the preparation of staff for teaching on computer literacy courses – initial development. (4.3)

(ii) the development of staff currently teaching 'computer literacy' within a variety of courses – continuing development. (4.4)

(iii) the development of staff concerned with other elements of vocational preparation provision – integrative development. (4.5)

Initial staff development

4.3 The 'initial development' needs of staff are likely to be in acquiring the necessary level of computing expertise, an appreciation and acceptance of the course philosophy and methodology, and the confidence to embark enthusiastically on teaching this course.

Three training strategies can be provided to meet the differing needs of staff coming to teach in this area:

(i) Computer literacy training. This will be necessary if staff with little or no previous experience in this area are to be trained for this role. The necessary training can be based upon the materials contained in this scheme, thus providing both the basic level of computer expertise and an introduction to the materials and methods to be used.

Three elements are recommended for inclusion in this scheme:

(a) An introductory computer literacy course
The aim of this is to create a level of computer literacy which will allow individuals to make appropriate decisions about their future training needs. This course is also suitable for general computer literacy/information technology training. A suitable outline is given below, with reference to appropriate teaching materials. However two important conditions must be satisfied before such a course starts. Firstly, there must be sufficient hardware available to provide an active hands-on experience for all course members. Secondly, the training must be preceded by an opportunity for the course members to share among themselves their previous experience, knowledge of, and attitudes towards computers and related technology. It is of paramount importance to create a strong group feeling at the start.

The course framework shown on pages 27 and 28 has been used successfully by an MSC Accredited Centre for YTS staff training.

(b) A period of training based upon the individual needs of the staff member. There must be the opportunity to assess needs and to prepare a learning plan, together with access to the computer facilities and structured support. An appropriate model for such training would be the BBC Referral Service – a tutorial system provided by many colleges linked to the BBC Computer Literacy Programmes and using the BBC microcomputer. Courses leading to recognised qualifcations are also attractive to staff.

(c) The opportunity to discuss the materials with an experienced tutor and to observe the teaching materials in action. This is best achieved by teaching in tandem with an experienced colleague but there are resource difficulties in providing this.

An Introductory Computer Literacy Course

TIME ALLOCATION	TOPIC AND KEY POINTS	MODULES/WORKSHEETS/STRATEGY
15 mins	What is computer literacy	Module A1 – exposition and use of O.H.T.
20–30 mins	Elements of a Computer System Input, Processing Output, Memory and Control. Backing Store, Software, Hardware	Modules B1 and B6 Worksheets 3, 4, 22 Exposition and group questions
50–60 mins	Operating a Microcomputer Load, run and respond to software from backing storage – tape or disc	Module B2 Worksheet 5 Individual hands-on experience using written instructions
15–20 mins	What is a program and why? The need for clear sequenced instructions to control the computer	Module C1 Worksheets 8 and 10 Exposition, demonstration of human robot-match exercise or programable tank
60 mins	Hands on Programming Input simple programs to show what computer can do. Individuals write own program or amend one	Module C1 and C4 Worksheet 11 Worksheets 13, 14, 29 and perhaps 34 and 35 Demonstration of how to correct a line of a program and then individual practice
15–30 mins	Sizes of Computers and some Applications Slides of applications and types. Visit to mainframe/mini installation	Modules B4, I1, D1, F1 Brief exposition with slides and perhaps video and then tour of computer facilities
15 mins	Application areas Commercial, office, industrial and educational applications. Building on the core.	Modules D1, E2, F1, G1 Exposition as introduction to software packages

TIME ALLOCATION	TOPIC AND KEY POINTS	MODULES/WORKSHEETS/STRATEGY
90–120 mins	Hands on the Packages (i) Stock Control—STOCK (ii) Word Processing-WORDWISE (iii) Microelectronic control – ROBOT and TANK (iv) Optimisation of materials – GLASSOP (v) Computer Based Testing – VTESTS, EDITOR, FEUTEST	Module D4 WS16 E1 WS17 E3/4 WS39 42 Module F2 WS10 Module F2 WS19 Modules Z Assessment Strategy – Small groups rotate around hands-on demonstrations
20 mins	Social Implications Impact upon employment opportunities. Computer Crime. Security of personal information.	Modules H1, H2, H3 Brief exposition and then a discussion.
30 mins	OPEN FORUM To consider questions and make plans for future training needs	

(ii) Introduction to Materials & Methods. This is needed for staff with the necessary level of computer literacy but with no experience of teaching on this particular course. A one day session together with being assigned to an experienced colleague could meet this need.

A suitable form for this provision is outlined on pages 29–31. It is important to stress the need to develop a group identity at the start and to teach this course in a way compatible with the aims of the computer literacy programme described here. It is also necessary that each person attending this course be provided with a copy of the relevant parts of this report.

The Implementation of Computer Literacy Courses

A one-day workshop to introduce the materials available and the teaching/learning strategies recommended.

TIME ALLOCATION	TOPIC AND KEY POINTS	MODULES/WORKSHEETS/STRATEGY
15 mins	Introduction The computer literacy materials	Module A1 and use of OHP
45 mins	Group Exercise – to develop group identity. To evaluate the relevance of computer literacy aims and objectives to course members' needs.	Analysis of computer literacy aims and objectives using group members' experience*
90 mins	Hands-on experience with software packages. MEET/CLASS FILE STOCK ' CUSTSYS ROBOT – BBC Buggy or TANK – electronic control GLASS – graphical display of optimisation	 Module A1 program description W&15, WS16 Module F2, WS10 Module F2, WS19 Course members in groups 3 or 4 tour workstations where these are set up. Course tutors available at each station to set task.
5–10 mins	Review of 'Hands-on'	Discussion in Plenary
80 mins 10 mins	Teaching & Learning Strategies, stressing activity individuality achievement and feedback An example, using 'Wordwise'.	Group members take role of trainees. Abilities are determined by questionnaire* administered earlier. Tasks are set individually or in groups of two using Module E3/E4. WS, 18, 39, 40, & 42 At end, groups form from individuals completing the same task and list what they have learned about Word Processing.
10–15 mins	Plenary Review of Teaching/ Learning Strategies	Guided discussion. Conclusion recorded.

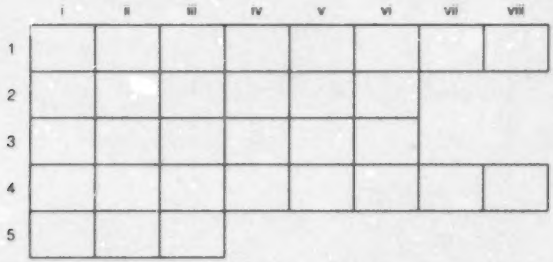
TIME ALLOCATION	TOPIC AND KEY POINTS	MODULES/WORKSHEETS/STRATEGY
40 mins	Assessment (Note; an introduction to assessment materials provided in the report and NOT a wider consideration)	Module Z Brief introduction, followed by small group work using 1) Computer Operations Profile 2) VTESTS 3) EDITOR AND FEUTEST
20 mins	Open Forum To consider comments of the group	
*Papers mentioned here are included below. i) Aims and objectives – workshop paper ii) Questionnaire on word processing skills		

COMPUTER LITERACY COURSE—WORKSHOP PAPER

Please complete the sheet for one selected type of course of which your workshop group has experience.

1. Type of course
2. Subjects included in course:
3. Please complete the grid below by specifying how appropriate your group feels that each aim/objective is for the course under consideration. You may choose from the range 1 (extremely appropriate) to 4 (inappropriate) for your answer.

Objectives



FEU COMPUTER LITERACY MATERIALS WORKSHOP

In order to assist with the organisation of this afternoon's activities, would you please complete the following brief questionnaire.

Name ..... College or Organisation .....

Please tick the appropriate box

(1) Keyboard Skills

(a) slow, one or two fingered typing

(b) reasonable speed

(c) near competent typist or better

(d) any other level; please specify here

.....

(2) Familiarity with 'Wordwise' wordprocessing facility

(a) have not used it previously

(b) only very limited experience of it

(c) have used it and familiar with the basic principles

(d) confident in using it (but cannot remember all commands)

(e) expert in use of the facility

Thank you.

(iii) Induction to the Parent Course – for all staff teaching computer literacy as an element of a parent course.
Many colleges are now providing induction schemes for staff who are going to teach on YTS courses. Each parent course would need to make its own arrangements.

In addition, the staff development support provided needs to include at least:—

(a) a team of teachers to provide support and an opportunity for group problem solving and the development of new materials;

(b) the opportunity to observe teaching of this subject across a variety of vocational preparation courses;

(c) resource-based materials for teaching and learning, to maintain teacher confidence in at least the initial stages;

(d) access to technician support for setting up and running the computers and for any 'crisis' which may occur.

Continuing staff development

4.4 Here the primary need is to provide staff with the opportunity and relevant experiences to allow them to reflect upon their own teaching approach, to evaluate its success. and to examine and devise new approaches and methods which could be appropriate. It is clear that curriculum development and staff development must be firmly linked both with each other and with course appraisal. Established staff must be able to engage in course development, together with staff new to this area. Meetings should be regular, structured and purposeful, and officially scheduled. The use of such staff in providing the training events at the initial stage can be an important element in the development of experienced staff, as it encourages them to reflect upon and make explicit the rationale behind their working practices. For staff recently trained in computer literacy the support and technical assistance outlined earlier is essential.

Integrative staff development

4.5 Computer literacy in the context of this study is always an element in some parent course. This produces a need to integrate it with that parent course, and with that need two staff development problems arise. Firstly, staff involved in other areas of the parent course need a sufficient appreciation of the computer literacy component to stimulate them to take advantage of what goes on there and use it in their own teaching. (This is not to be confused with the general staff development need for computer literacy – see FEU Project RP56, Staff Development on Microcomputers.) Secondly, computer literacy staff need an appreciation of the philosophy and methodology of the parent course.

A basic staff development course in computer literacy using the materials developed in the project has already been described. This can be used both as a basic training for staff preparing to teach computer literacy and as an integrative training for "core skills" staff. The materials and techniques presented in this report were highly successful when used with an adult group.

Chapter 5
The Teaching Materials

General

5.1 This chapter describes a variety of materials which have been developed to assist those involved in running computer literacy courses. It cannot claim to represent the last word on the subject; this is an area of work which needs continual development and review in order to keep pace with the changing nature of the technology and its impact on everyday life. It is hoped, however, that the ideas and materials presented here are structured to allow a flexible approach to their use, taking account of the many different environments to which they may need to be adapted, the differing levels of resource which will be available to support them in different institutions, and the need for courses to keep abreast of further developments in the use of information technology. To help in this last consideration, the project team will be issuing update sheets to this report from time to time.

The modular structure

5.2 In order to implement the computer literacy aims and objectives, a series of teaching modules has been developed. There are fifty-seven of these. Each is intended to cover a one-hour teaching session; however, they can be extended if desired by greater use than specified of student worksheets, project activity etc.

Twenty-eight of the modules have been designated as 'core' modules. These form the basic minimum required to fulfil the computer literacy aims and objectives, and should be included in their entirety in any course of which computer literacy forms a part. These modules, together with supporting materials, make up the second booklet in this series 'Unit 2 – Core Materials'.

Experience in running pre-vocational courses, however, has shown the need for a flexible scheme of additional modules which will enable the student to progress further in computing knowledge and skills in particular applications areas. Accordingly, the twenty-nine additional modules develop computer literacy further down the road of more specialised applications and computing knowledge. These make up the two further booklets 'Unit 3 – Further Computing', and 'Unit 4 – Vocational Options'.

A complete list of all modules, core and supplementary, is shown overleaf. Each module is intended to fill approximately one hour.

The Computer Literacy Modules

(Core modules are denoted by an asterisk)

MODULE	SECTION	UNIT	PAGE
*A1 What is computer literacy?	A	2	12
*A2 You and the computer	INTRODUCTION	2	18
*B1 What is a computer?		2	26
*B2 Operating a computer		2	36
*B3 Meeting the microchip		2	44
*B4 Computer systems	B	2	46
B5 History of computing	COMPUTER BASICS	3	12
B6 How does a computer work?		3	16
B7 Computer storage		3	22
B8 Analogue and digital devices		3	28
*C1 What is a program?		2	56
*C2 Drawing a flowchart		2	60
*C3 Program control		2	66
*C4 Writing a program		2	76
C5 Further flowcharting		3	38
C6 Further programming	C	3	43
C7 Introduction to graphics programming	UNDERSTANDING	3	52
C8 Writing a graphics program	PROGRAMS	3	60
C9 Writing a project program		3	64
C10 Testing a project program		3	64
C11 Programming languages		3	74
C12 An alternative language		3	78
*D1 Computers in business		2	86
*D2 Using a business package		2	90
D3 What is stock control?	D	4	12
D4 Stock control in business	BUSINESS APPLICATIONS	4	22
D5 The clock card		4	28
D6 Wages		4	34
D7 The Payroll		4	42
D8 At the bank		4	46

MODULE		SECTION	UNIT	PAGE
*E1	What is a word processor?	E OFFICE APPLICATIONS	2	108
*E2	The electronic office		2	120
E3	Word processing		4	54
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*F1	Computers in industry	F INDUSTRIAL APPLICATIONS	2	128
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*Z1	Introduction to assessment	Z ASSESSMENT	2	178
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*Z3	Final assessment procedure		2	180

N.B. Assessment modules should be implemented at the beginning, middle and end of any course.

It is intended that these modules should serve as a basis for putting together computer literacy schemes for pre-vocational courses. All students should take the core modules and, in addition, other modules may be selected to extend the course as appropriate to occupational needs. This technique is appropriate to the Youth Training Scheme, where the computer literacy core may form part of YTS core studies and additional modules may be chosen to meet the needs of specific Occupational Training Families.

Content

5.3 The teaching materials are classified into ten sections. These are as follows:

Section A	INTRODUCTION
B	COMPUTER BASICS
C	UNDERSTANDING PROGRAMS
D	BUSINESS APPLICATIONS
E	OFFICE APPLICATIONS
F	INDUSTRIAL APPLICATIONS
G	OTHER APPLICATIONS
H	SOCIAL IMPLICATIONS
I	VISITS
Z	ASSESSMENT

Each section broadly covers a topic area although there are many areas of overlap and staff using the materials are urged to become familiar with the material in all the sections.

The following is an outline of the types of material to be found within each section:

(a) Detailed module breakdowns
These outline the course aims and objectives to be met or partially met during each session, and break down the modules into Memory, Understanding and Doing objectives and describe strategies by which these may be achieved. Also included are key computer vocabulary to be introduced/used during the module, resources needed, and any relevant assessment to be carried out. There are three assessment modules, which should be followed by all courses. These modules constitute initial, mid-course and final assessment recommendations and have been developed with the intention that they can be integrated into the assessment requirements of parent courses. The assessment section also contains a bank of assessment materials.

(b) Worksheets
'Worksheets' is used here as a general term to cover a variety of teaching materials developed by staff involved with the project. Most worksheets are in a form suitable for use with the student; however some are suggestions for activities rather than direct activity sheets, and others are in two parts, the first containing material for the teacher, and the second being the section for student use.

(c) Projects
Each teaching module includes provision for time when students will be able to work on projects. This is intended to allow scope for students of differing abilities to work at their own speeds rather than at the speed of the rest of the class. The use of project work also provides an opportunity to integrate areas of work covered in different modules. A variety of suggestions for projects are included in the teaching materials.

(d) OHPs
Copies of these are included where they have been developed.

(e) Films/Videos
Detailed breakdowns have been given for appropriate material of this kind. With some, there are also suggestions for linked student tasks. Where extensive use is made of video-taped material, it has been found necessary to set tasks in order to maintain the level of student concentration.

(f) Software
An outline of each recommended program is provided, with details of where it can be obtained.

Classroom use

5.4 The modules are intended for use primarily with vocational preparation schemes, and the material is designed for the students to be found on these courses. It has been found, however, that because of the wide range of different groups of students involved, the spread of ability, and the diversity of backgrounds, it has sometimes been necessary either to cover topics in less depth than suggested or to insert additional material. For this reason, and also because of the range of different hardware and software which is likely to be used to support this type of course, the modular breakdowns should be used as a guide rather than seen as a fixed course. Colleges need to be free to vary the sessions as appropriate to their students and to contribute ideas and materials of their own, since it is recognised that computer literacy can be presented in many different ways and that every college will have different resources and expertise available.

Making use of the materials

5.5 It is recognised that staff using these materials will be drawn from a variety of different backgrounds and will have a greater or lesser familiarity with both the nature of computer technology and with the teaching strategies which are most appropriate to pre-vocational courses. Staff already experienced in this type of work may wish to use the Computer Literacy Units simply as a bank of materials and recommendations, to be drawn on as required. It is anticipated, however, that many of those becoming involved in the provision of computer literacy courses will be new to this area of work, and to assist these staff a suggested program for using the materials is provided below. It is assumed that they have already read chapters 1–4 of this manual.

TO USE THE MATERIALS:

Step 1 Familiarise yourself with the definition of computer literacy given in Chapter 2, i.e. the student aims and objectives. Note that some objectives are defined as 'core', and are seen as integral to the achievement of full computer literacy, while others are 'subsidiary' only, and will relate to longer or more occupationally-specific courses.

Step 2 Select appropriate modules for your course from the list on pages 36–37. The titles are generally self-explanatory, but the detailed modular breakdowns in the relevant Units may be referred to if more detailed information is required. Note that core modules are marked with an asterisk and should be included in all computer literacy schemes.

Step 3 Ensure that you have at least Unit 2 of the guide available; you will also need Unit 3 and/or 4 if you are planning to use additional modules in your course.

Step 4 Find detailed modular breakdown sheets in the relevant units for each module to be used on the course. Select appropriate materials to use with each module, either from those provided with the module, or from any others which are available to you. Then make a note of the resources needed. Check any unfamiliar key vocabulary with the Glossary.

Step 5 Read Chapter 7, which gives the general assessment strategy of the scheme, and use this – together with the assessment materials in Section Z of Unit 2 and the references to assessment in the modular breakdowns – to plan the assessment for your own course.

Step 6 Read the detailed resource recommendations given in Chapter 3 and ascertain what resources are available for your own course. Check these against resources which will be required for the modules you wish to run. Where particular programs, videos, hardware etc. which are recommended

in the guide are not available to you, it will be necessary to find alternatives or substitute another activity.

Step 7 Read Chapter 6, which gives examples of class management strategies which can be used when teaching computer literacy and which provides some guidance in planning lessons.

After this, you should be ready to begin detailed planning for running your own course. Note that Chapter 4 provides some guidance on staff development strategies if you need assistance in this area.

Chapter 6
Class Management Strategies

6.1 The view expressed here is shared with many other agencies making recommendations on current approaches to teaching and learning. It is felt that the achievement of student/trainees can best be maximised by:

(i) starting from the individual needs of the student/trainee,

(ii) providing active, participatory, experiential learning opportunities,

(iii) relating these activities firmly to the contemporary experience of the students and their aspirations for the future, and

(iv) having teachers with a range of interpersonal and group dynamic skills who are also seen to be well aware of the world outside education/training.

6.2 It is hoped that the materials provided in this guide will assist in providing some of these conditions. To achieve the best results, teachers should aim to provide pace, direction and autonomy for their students. There may appear to be a paradox here, a conflict between direction and autonomy. Autonomy must be prepared for; students must be provided with the individual learning skills that will enable them to be independent. They must also practise this independence in learning. The course materials provide many instances of structured activities designed for individual or small group performance. Indeed, it is recommended that there is a period of individual or small group work included in every module, and that teacher exposition to the group is kept at a minimum. The purpose of these activities is not only the achievement of the course objectives but also the development of autonomy in the student. Projects which serve to integrate various modules provide greater freedom for individual action, and it is in these that the student becomes more responsible for his/her own learning.

The strategy of providing structured activities for individual students serves another purpose, that of allowing the teacher to interact on a one-to-one basis with the students. This face to face contact is vital for a number of reasons. It provides time for counselling, assessment, reinforcement, remedial help, etc.

A survey of class management problems and effective responses

6.3 Staff testing the materials developed during this study were given a questionnaire with the aim of determining what were the causes of any class

management problems and how they could be dealt with. It was found that the main problems experienced involved student groups which varied widely in terms of ability and motivation and/or resulted from a limited availability of hardware and software.

Strategies outlined for tackling problems were all designed to maximise both the individual contact between tutor and students and the amount of time spent by the students in individual and/or small group activities. The problem of limited hardware availability can be alleviated by certain management strategies such as sharing and split group rotation, but there is a minimum level of equipment and of effective technician support which must be available. The sharing of computers as a means of dealing with a particular level of resources can be an effective strategy. The advantages of doing this are:

(i) students who lack confidence can be helped by working together,

(ii) students can be paired so that the more able can help the less able. This help can be in the use of the hardware and/or in the interpretation of instructions given,

(iii) the teacher is available to give help where and when it is needed – the number of places needing help is halved.

However, there are disadvantages:

(i) in pairs, one student may do all the work,

(ii) one student may distract the other,

(iii) the responsibility for completing a set task is halved,

(iv) there is insufficient activity to keep up the pace of learning.

The provision of alternative activities, one half based upon machine use and the other not, is another strategy which can be employed. The guide provides many examples of activities which can be undertaken.

Examples of specific management strategies

6.4 Examples of class management strategies are given for Modules C4 and D2; the time allocated for each is one hour but, as can be seen, could easily be longer.

Module C4 'Writing a Program'

Situational Constraints

Students – 15. Range of ability – 6 at least are capable of writing 15–20 line programs but 4 will have difficulty and lack confidence.
Hardware – 8 microcomputers, cassette backing storage.
Time – 1 hour

Lesson Strategy

INTRODUCTION: Review of vocabulary and relevant concepts from previous modules
Divide class into 2 groups – the more able and better motivated to use microcomputers to run VTEST (Unit 2) and record scores. Other group to use question and answer to revise previous knowledge of programs. 10 minutes

DEVELOPMENT: To enable student to achieve objects stated

(1) To total group –
   (i) set objective – to write, run and store a program.

   (ii) review features of program – use WS13 to look at an example of a program – ask group what it does – conclude with diagram:
   INPUT – person's name
   PROCESS – find date of birthday for that name
   OUTPUT – print date of birthday

   (iii) indicate to group that the meanings of certain BASIC commands are given on WS13
   (iv) set task given in WS13 10 minutes

(2) In pairs –
Pair students according to similar ability, so that groups will not finish together.

Pairs can rearrange program statements using the microcomputer. When the program runs successfully they can list it and copy it down or print it. (Flow-chart optional)
Teacher (and technician if available) provide individual help 15–20 minutes

(3) To each pair –
As pairs complete task, check completion and set programming task. The 6 best students should finish first; set them a task from WS29 (Unit 3) – this to be done individually. For less able students, set WS14 (Unit 2), and allow the least confident to work in pairs.

(4) To each individual –
10 minutes before end, check stage reached.

CONCLUSION: To check progress and prepare for next stage
To whole group –
Ensure that results of WS13 (Unit 2) task are stored in folder and that student progress log is completed. Ensure all students KNOW that they are to complete programming task by specified time.

DEMONSTRATION –
load MEET (Unit 2) (Students have seen it before) LIST MEET – show program statements, change one or two statements and RUN to show changes. Stress easy to change programs – perhaps mention computer crime.

This demonstration can be used at any suitable time in lesson – or left out if time does not permit.

NOTE: This lesson could last considerably longer than 1 hour.

Module D2 'Using a Business Package'

Situational Constraints

Students – 15. Wide range of ability
Hardware – 6 microcomputers
Time – 1 hour

Lesson Strategy Note this is based on the use of STOCK, (Unit 2); WS15 (Unit 2) contains a detailed strategy for CUSTSYS

INTRODUCTION Brief review of previous vocabulary and business applications As a whole group, but pick only 3 or 4 key words – no more than 5 minutes. Briefly, set objective for lesson; to use STOCK package in a model business environment.

DEVELOPMENT To set up model situation and use STOCK PROGRAM
Pre-lesson Preparation

(i) Create and load at least 5 product files – see WS16 (Unit 2) for information required.

(ii) Prepare a list of the day's sales of each of 5 products above. Ensure that at least 2 will require re-ordering and sales information slips.

(iii) Prepare a list of product changes, e.g. price/re-order level/suppliers address and a changes slip. (N.B. It would be better if 3 alternative lists of daily sales sheets and product changes could be produced).

(1) To total group –
Set task, in groups of three students, and set roles:

(i) Stock controller – display files and write a list of item number and description. Then respond to sales and product change messages,

(ii) Sales clerk – fill in sales slip for each item and pass to stock controller,

(iii) Product changes clerk – fill in changes slip for each stock item and pass to stock controller.

(2) To each group –
Check progress in task and change roles until all students have played the roles or time limit is reached. Then set task to group to write down the ways in which this system could be improved in a real situation – at least 3 ways.

(3) To total group –
Review total performance, identify any problems/failures in system. Each group presents its 3 improvements. Individuals record activity in student progress log.

CONCLUSION Review lesson – reinforce changes in system, and convenience of computer system – link to improvements needed in model system.

Chapter 7
Assessment

The assessment procedure

7.1 The need for a coherent strategy of student assessment has been one of the factors borne in mind when designing and piloting the computer literacy course. In this context, student assessment is seen as having two main objectives:

(i) to motivate the student and promote further learning by involving the student in the process;

(ii) to provide evidence of student progress and achievement.

7.2 To assist in the achievement of these objectives, three of the 'core' computer literacy modules have been designated as assessment modules. The first of these allows for an initial assessment of experience, ability and attitude, the second is a mid-course review, and the third provides for a final assessment procedure at the end of the course.

7.3 In addition, it is recognised that student assessment is by its very nature an on-going process, which cannot be confined to three stages within the curriculum. Each module, therefore, contains guidance for assessment procedures relating to the student objectives within the module. A variety of materials are also presented with the three assessment modules; these are described later in the section, and may be used wherever appropriate throughout the course. The use of a student progress log to keep a record of student achievements is seen as central to the assessment strategy.

Student achievement

7.4 It is not possible to discuss assessment without a consideration of student achievement. In the initial piloting stage of the project, all students completing the courses which were evaluated achieved the objectives set them, even if the level of achievement varied. The most important conclusion which can be drawn from this is that conventional descriptions of student ability and potential have little relevance in this connection. Some students who experienced learning difficulties in other areas have shown that they have the ability to develop both the knowledge and the skills that this course sets out to impart. There would appear to be at least two factors involved in this phenomenon. First, in attempting learning by doing and then transferring this into the achievement of cognitive learning objectives, it was clear

that 'underachievers' were able to obtain early success and derive positive motivation from it. Secondly, the interaction with the computer provides the student with a non-threatening situation in which success will be positively reinforced. Tutors are, therefore, advised not to make any assumptions about student potential based upon traditional descriptions of ability.

Assessment materials

7.5 A range of possible assessment materials is provided with the modules in Section Z of Unit 2. These may be used with the specific assessment modules, but also throughout the course. Although these materials are intended only as a guide to users, they attempt to match the range of skills it is hoped the students will acquire. However, the range of students for whom the modules have been found useful is already very wide, and it is unlikely that assessment materials produced for one group of students will perform satisfactorily over this full range. Additionally, it is intended that the approach by teachers to the use of the modules should be flexible and any suggested teaching strategies are not intended to be prescriptive.

It has, therefore, been assumed that teachers making use of the modules will, whilst welcoming the inclusion of prepared materials, also wish to produce test materials of their own to match their students and their approach.

Category of skills

7.6 The modules have been presented in a form which assists in the preparation of an assessment specification based on a simple taxonomy of skills, namely:

M = Memory
U = Understanding
D = Doing

A module might include under these headings:

Memory –
Relevant vocabulary and concepts from previous modules, e.g. mainframe, mini, micro.
New vocabulary related to 'Computers at work', e.g. bar codes, data capture etc.

The use of computers at work both in information processing and control.
Examples of use of computers in selected jobs relevant to student aspirations.

Understanding –
Selective extraction of information from a variety of sources.
Decision making based on own aspirations and knowledge of computer applications.

Doing –
Practical skills – use of microcomputer information.

7.7 Multiple choice objective tests have been found to be appropriate for assessing the information retained by the student – the 'memory' component.

Whilst performance on some of these tests could demonstrate 'understanding', this is better assessed through the results of the structured activities and worksheets; for examples see the Student Activity Record. These activities will also permit assessment of the practical skills ('doing') that the student has acquired. In order to provide both 'hands-on' participation and further evidence of practical skill levels, three software packages have been developed by GlosCAT and associated colleges to help in the assessment process. These are as follows:

(1) HANGMAN – a program which allows the user to play 'Hangman' and identify computer vocabulary. This is useful for lower ability students, and can serve also as a test for loading and running programs.

(2) V TEST 1–4 and V TEST 5–7 programs for computerised multiple choice vocabulary check tests designed to link up with areas in the computer literacy course. These are referred to within the student progress log and have been extensively used on pilot courses. The documentation is produced so that it may be used as a 'paper and pencil' test without alteration.

(3) FEUTEST PROGRAMS – a package which offes freedom and flexibility to match assessment to the ability of the student group. It allows teachers to produce their own materials for testing the 'memory' objectives with the minimum of effort. The package enables –

(a) Teachers to produce their own materials for testing student learning on a particular module, or range of modules,

(b) Students to respond to the test material in an interactive mode using some of the practical (Doing) skills acquired in completing the modules.

Detailed documentation for these packages is found in Section Z of Unit 2.

Assessment of computer literacy in relation to the parent course profile

7.8 The CGLI 365 profile of attainment level in basic abilities is a widely used model for the recording of assessment in pre-vocational schemes. It is, therefore, this profile which is considered here. Computer literacy is included as part of the CGLI 365 Vocational Preparation course at GlosCAT, and the staff involved have used the assessments made on computer literacy as a basis for the completion of this profile. The conclusion reached was that assessments made on the developing abilities in computer literacy could quite easily contribute to most of the basic skill attainment levels.

7.9 An attempt has been made on some project and activity worksheets to give an indication of the levels of basic skills attainment that can be indicated by performance in them. Some computer literacy activities and their relation to various basic skills attainment levels (as defined in CGLI 365) are set out on pages 53–56. Note that all page references relate to Unit 2 in this series of booklets, where all these materials are to be found.

Social skills

	PAGE
(1) Working with colleagues. Evidence of all levels of achievement can be obtained from the completion of group exercises.	
Levels 1 & 2 – Sizes of Computer	48
1, 2 & 3 – Industrial applications	133
All levels – Customer Account system	97
(2) Working with those in Authority. All levels can be considered in the light of tutor-student relationships.	
(3) Self-awareness.	
Levels 1 & 2 – Initial and Final Assessment	178/180
– Job Search	162
All levels – Student Progress log	181
(N.B. Some tutors expressed concern over gradings at levels 3 & 4)	

Practical skills

	PAGE
(1) Using Tools. It was considered that this skill was not demonstrated at all by the computer literacy course.	
(2) Working with machines. Computer operation was seen to be working with a machine but whilst evidence was provided at all levels on the operation of one machine a variety was not available. For all 4 levels see Computer Operation Profile.	42
(3) Dexterity and Co-ordination. The level of keyboard skills was considered to relate to dexterity and co-ordination.	
(4) Measuring. Little direct evidence but the activity based upon optimisation of material use – 'Glass utilisation' does provide evidence for levels 1, 2 and perhaps 3.	
(5) Calculating. Levels 1 & 2 – 'Elements of a Computer System'	29
1, 2 & 3 – Simple and complex program exercises	56–84
Customer Accounts System	97

Decision skills

	PAGE
(1) Planning. Since this is the basis of programming, evidence is supplied for this criterion at levels 1, 2 & 3. Evidence as to achievement of level 4 would come from a wide range of course/assessment activities, in particular programming and flow-charting.	
(2) Information Seeking.	
Levels 1 & 2 –Vocabulary & Programming Command Sheet	79
1, 2 & 3 – Sizes of Computer	48
1, 2, 3, 4 –Applications	
Job Search	162
(3) Problem Solving	
Levels 1, 2 & 3 – Read and Amend simple program	78
– Write and document program	81
– Job Search	162
(4) Evaluating Results	
All levels –Evidence from assessment procedure itself, completion of student progress log and in negotiated assessments (Z1, Z2 & Z3)	178–180
(N.B. The computer literacy assessment is related to basic skills as defined by CGLI 365 profiling scheme; however it is anticipated that it could relate equally satisfactorily to other schemes)	

Communication

	PAGE
(1) Talking and Listening Evidence of all levels can be obtained from all aspects of the course, e.g.	
Levels 1 & 2 – Simple program production	78–81
1, 2 & 3 – Group activities – Customer Account	97
(2) Reading and Writing	
Levels 1 & 2 – All Worksheets	
1, 2, 3 & 4 – Student Progress log	181
Word Processing Exercises	113–119
(3) Visual Understanding	
Levels 1, 2 & 3 – Graphic Exercises	148

Appendix A
List of Colleges Associated with the Project

(i) FEU EXPERIMENTAL COLLEGES
The following three colleges have been grant aided by the FEU to investigate Computer Appreciation. They have tested our existing materials and have contributed to the development of new modules:—

Cambridge College of FE

Southgate Technical College

Worthing College of Technology

(ii) PILOTING COLLEGES
The following colleges have piloted materials:

Mid Glos Technical College, Stroud
Abingdon College of FE
North Warwickshire College of Technology and Technology and Art, Nuneaton
Frome College, Frome, Somerset
Oldham College of Technology
Yeovil College, Somerset
South Warwickshire College of Further Education, Stratford
Uxbridge Technical College
Trowbridge Technical College, Wiltshire
Oxford College of FE Oxford
Bournside School, Cheltenham

Appendix B
Glossary of Computing Terms

This glossary is intended to give simple, non-technical definitions of the main computer terminology introduced in the core modules. For more detailed technical definitions, and for the more specialised vocabulary introduced in the supplementary modules, the teacher is advised to consult a computer text-book. General business terms, and program instructions, have not been included.

		Module Introduced in:
ACCESS	Obtaining information from a computer file	G2
APPLICATION	Any use to which a computer is put	A2
BACKING STORAGE	Any form of storage which a computer uses to keep information which is not permanently held in memory. Tape and disc are the most common types.	B1
BAR CODE	A strip containing printed lines of different widths, which contains information which can be read directly into a computer. Commonly used on such things as grocery items and library books	B4
BASIC	The computer language most commonly used on microcomputers	C3
BATCH PROCESSING	A type of computer processing where information is dealt with a batch at a time	D1
CAD	Computer Aided Design	F1
CAL	Computer Aided Learning	G1
CAM	Computer Aided Manufacture	F1
COMPUTER	An electronic machine which processes data automatically	A1

COMPUTER LITERACY	The ability to use computer vocabulary, understand and operate a computer system, recognise the function of computer programs and appreciate a range of uses for computing technology	A1
DATA	Words, numbers, pictures, or other information handled by a computer	B1
DATA BANK	An organised collection of information held on a computer which is available to the public through computer terminals	E2
DATA CONTROL CLERK	A clerk who is responsible for handling computer, input and output	H3
DATA COMMUNICATIONS	Transmitting data electronically down a communications line	E2
DATABASE	An organised collection of information held on a computer	D1
DATA PREPARATION	Getting data ready to put into a computer – usually by punching it on cards or paper-tape	D2
DATA PROCESSING	Handling raw data to produce useful information (usually by computer)	B1
ELECTRONIC MAIL	Sending correspondence by electronic means	E2
EXPERT SYSTEM	A computer system which gives professional advice	H1
FLOWCHART	A method of illustrating a logical sequence of events	C2
GRAPHICS	Computer handling of pictures and diagrams	H1

HARDWARE	The physical equipment making up a computer system	B1
INFORMATION TECHNOLOGY (I.T.)	The storage, manipulation and transmission of any form of data, using computers and communications facilities	E2
INPUT	How data gets into a computer system	B1
KEYBOARD	A computer input device with labelled keys; is usually linked with a display screen	A1
LANGUAGE	A structured method of giving a computer instructions	C1
LISTING	A printed computer program	D2
MAGNETIC DISC MAGNETIC TAPE	Forms of computer storage	B1
MAIN FRAME COMPUTER	The largest size of computer: characterised by relatively high cost, storage capacity and processing power	B4
MEMORY	A form of storage immediately available to a computer, in which all processing is done	B1
MICROCHIP/SILICON CHIP	A device containing micro-electronic circuitry on a silicon wafer	B3
MICROCOMPUTER	The smallest size of computer, built round a microprocessor	A1
MICROPROCESSOR	A silicon chip containing a control and processing unit	B3
MINICOMPUTER	The size of computer falling between 'main-frames' and 'micros'	B4

NETWORK	A method of connecting computers together allowing data to be passed between them	H1
ON-LINE	Sending data to and from a computer down a communications line	A2
OUTPUT	How information from a computer system is conveyed to the user	B1
PACKAGE	Standard ready-written software suitable for more than one user	A1
PERIPHERAL	Any device connected to the central processing unit of a computer	B4
PRINTER	A device for producing printed output from a computer system	B1
PROGRAM	A set of instructions telling a computer what to do	A1
PUNCH OPERATOR	Someone who operates a machine for punching data onto cards or paper-tape	H3
REAL-TIME	On-line processing where details held on a computer are altered almost at once	D1
ROBOT	A device which is equipped with sensors and mechancial parts and which is computer-controlled	F1
SENSOR	A device for detecting and registering physical signals	F2
SILICON CHIP	See MICROCHIP	B3
SOFTWARE	The programs of instructions which control the behaviour of a computer	B1
SYSTEMS ANALYST	Someone who specialises in analysing a systems problem and suggesting or designing a solution which usually involved the use of a computer	H3

TELETEXT	A service which uses the television signal to send requested information to a TV screen, e.g. ORACLE, CEEFAX	G2
TERMINAL	A peripheral device which is on-line to a computer; most commonly, a keyboard with screen.	B4
VDU	Visual Display Unit; a screen and keyboard for entering and receiving data from a computer	A1
VIEWDATA	A data bank service which generally uses telephone lines to send and receive information, e.g. PRESTEL	G2
WORD PROCESSOR	A computer with devices and programs specially designed for handling text	E1

Appendix C
Steering Committee

P. Davey (Chairman)	Head of Dept. of Computer, Electronic and Mathematical Studies, GlosCAT
B. Cattle	Head of Department of Educational Technology, Southgate Technical College
W. Congalton	Development Officer, FEU
G. Ewan	Executive, Computer Services Industry Training Council
C. Grewcock	Principal Lecturer, YTS, GlosCAT
N. Harrington	Manpower Services Commission, Regional Office, Bristol
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Mrs. J. Lloyd	Project Team, GlosCAT
J. Mansell	Chief Officer, FEU
R. Margetts	Regional Director, MEP
P. Shuker	Principal, Leeds College of Building
J. Taylor	Project Team, GlosCAT (Staff Development Officer)
P. Waite	County Adviser, Gloucestershire
C. West	Project Director, GlosCAT

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Computer Literacy

The **Computer Literacy** report aims at assisting the FE system to understand the concept of computer literacy and to make it an essential part of curriculum provision. The report, which is intended as a guide to further education colleges and training agencies on introducing computer literacy into FE curricula and training schemes, results from a two-year, FEU-funded curriculum research project centred at Gloucestershire College of Arts and Technology.
Although the primary aim of the project was to develop and evaluate curricula, hardware, software and other resources for vocational preparation schemes based in colleges and elsewhere, the material is also suitable for teaching computer literacy to the uninitiated throughout the entire age range covered by further and adult education, and as part of many training courses. While offering guidelines for those responsible for providing computer literacy courses (including coverage of the staff development aspect) the major proportion of the report provides the classroom teacher with detailed teaching plans and a wealth of resource materials. As well as the numerous worksheets, project suggestions and programs which form part of each module, valuable information is provided on additional resource materials available (including audio-visual) to support the successful teaching of both basic computer literacy and a range of further skills and knowledge.

The Units

*The **Computer Literacy** report is divided into four units, each of which is available separately.*

1 General Guide

*The first **Unit** gives general guidance, both to those **providing** computer literacy courses in colleges (Principals, Vice Principals, Heads of Department, and others engaged in the management function) and to the **classroom teacher** who is looking for advice and support. It contains an overview of computer literacy in the context of education and training schemes, an introduction to the teaching materials contained in the other units, and resource and staff development recommendations. Guidelines are also given for class management strategies and assessment methodology.*

2 Core Materials

*Made up primarily of teaching modules and supporting materials, this **Unit** is intended for the classroom teacher. Twenty-eight modules are provided, each one intended to cover approximately one hour of the computer literacy course. Each module is defined in terms of learning objectives, and is structured into Memory – Understanding – Doing – Strategies/Activities. The modules are accompanied by supporting materials which take the form of hardware or software recommendations, worksheets, suggestions for projects, or similar documents. The modules in this unit together provide a course which should allow those taking it to achieve the computer literacy objectives which also form a part of this unit.*

3 Further Computing

*This is of a similar format to **Unit 2,** but containing additional teaching modules and supporting materials. The twelve modules contained in this unit cover additional material in the basic areas of how computers work, the background to their development, and knowledge of computer programming. These modules would not be expected to form part of a standard computer literacy course, but would be available for groups with an interest in developing further knowledge and skills in any of these areas.*

4 Vocational Options

*Again of a similar format to **Unit 2,** this contains vocationally specific teaching modules and supporting materials. The seventeen modules contained in this unit cover additional applications of computing in industry, commerce, and a variety of other areas. Like the materials in **Unit 3,** these modules would not be expected to form part of a standard computer literacy course, but would be available for groups with an interest in developing further knowledge and skills in any of these areas.*

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